

Appl. No. 10/086,497
Amendment dated: February 27, 2004
Reply to Restriction Requirement of November 28, 2003

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims

1. (Currently Amended) A layer-by-layer etching apparatus using a neutral beam, the layer-by-layer etching apparatus comprising:
a reaction chamber having a stage therein on which a substrate to be etched is mounted;
a neutral beam generator, including:
an ion source for extracting an ion beam having a predetermined polarity from a source gas and for accelerating the ion beam; and
a plate-shape reflector which is positioned in a path of the accelerated ion beam and is tiltable to control an incident angle of the accelerated ion beam in a range of 75 to 85 degree from a vertical line with respect to a surface of the reflector, whereby the reflector reflects and neutralizes the accelerated ion beam for generating to generate a neutral beam from a source gas and to supply the neutral beam into the reaction chamber;
a shutter disposed between the neutral beam generator and the reaction chamber, for controlling the supply of the neutral beam into the reaction chamber;
an etching gas supply for supplying an etching gas into the reaction chamber;
a purge gas supply for supplying a purge gas into the reaction chamber; and
a controller for controlling the supply of the source gas, the etching gas, and the purge gas and opening and closing of the shutter.

2-3. (Canceled)

4. (Previously Presented) The layer-by-layer etching apparatus of claim 2, wherein the reflector comprises a plurality of co-centric cylindrical reflecting members and different polar voltages are applied to adjacent reflecting members.

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5. (Currently Amended) The layer-by-layer etching apparatus of claim 21, wherein the reflector is one of a semiconductor substrate, a silicon dioxide, and a metal substrate.

6. (Currently Amended) The layer-by-layer etching apparatus of claim 21, wherein the ion source is one of a high-density helicon plasma ion gun and an ICP-type ion gun.

7. (Previously Presented) The layer-by-layer etching apparatus of claim 1, wherein the substrate to be etched contains silicon.

8-16. (Cancelled)

17. (Previously Presented) The layer-by-layer etching apparatus of claim 1, wherein the neutral beam is an argon neutral beam.

18. (Previously Presented) The layer-by-layer etching apparatus of claim 1, wherein the etching gas comprises a chlorine gas.

19-21. (Cancelled)